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# A Brief AMTAS Status Report

prepared by

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# Joint Advanced Materials Center of Excellence

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- The Joint Advanced Materials (JAMS) Center of Excellence is co-led by the University of Washington (UW) and Wichita State University (WiSU).
    - UW: Center for Advanced Materials in Transport Aircraft Structures (AMTAS)
    - WiSU: Center of Excellence for Composites and Advanced Materials (CECAM)
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# AMTAS Administration

## *University of Washington*

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- Prof. Mark Tuttle, Director  
206-685-6665  
[tuttle@u.washington.edu](mailto:tuttle@u.washington.edu)
  - Prof. Kuen Lin, Co-Director  
206-543-6334  
[lin@aa.washington.edu](mailto:lin@aa.washington.edu)
  - Ms. Ellen Barker, Assistant to the Director  
206-543-0299  
[nelle@u.washington.edu](mailto:nelle@u.washington.edu)
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# AMTAS Participants

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- AMTAS currently consists of:
    - Four academic partners
    - Nine industrial partners
  - All partners are located or have a significant presence within the Pacific Northwest
  - Additional academic/industrial partners will be added as appropriate and as opportunities arise
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# AMTAS Participants

## *Academic Partners*

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- **University of Washington (UW)**
    - main campus in Seattle, WA
    - 35,000 students
    - <http://www.washington.edu/>
  - **Washington State University (WaSU)**
    - main campus in Pullman, WA
    - 22,500 students
    - <http://www.wsu.edu/>
  - **Oregon State University (OSU)**
    - main campus in Corvallis, OR
    - 18,000 students
    - <http://oregonstate.edu/>
  - **Edmonds Community College (EdCC)**
    - Lynnwood, WA
    - 11,000 students
    - <http://enr.edcc.edu/>
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# AMTAS Participants

## *Industry Partners*

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# AMTAS Participants

## *Industry Partners*

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- One of the largest corporations in the U.S., Boeing is involved in all aspects of the aerospace industry, including commercial transport aircraft, military aircraft, spacecraft, defense systems, air traffic management, and other associated products and services.
  - Boeing is the primary industrial partner of AMTAS
  - <http://boeing.com>
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# AMTAS Participants

## *Industry Partners*

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- Located in Auburn WA, Composite Solutions is a majority-owned subsidiary of the Topkey Corporation of Taiwan. The company has produced advanced composite structures for many modern aircraft, and has substantial expertise and experience in integrated tool design, composite tool fabrication, and composite manufacturing processes.
  - [www.compositesolutions.com](http://www.compositesolutions.com)
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## AMTAS Participants *Industry Partners*

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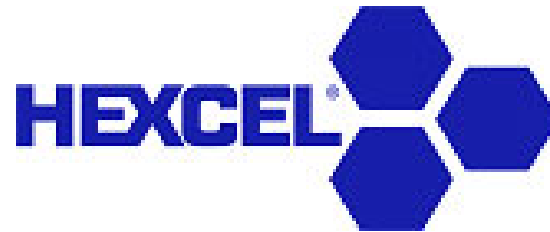
- Headquartered in Seattle, Heatcon designs and manufactures complete composite repair systems, including the model HCS9000B and HCS9200B Hot Bonders and associated equipment and supplies. Associated equipment includes thermocouple welders, vacuum generators, temperature recorders, silicone rubber heat blankets, and composite repair materials in small or large quantities.
  - [www.heatcon.com/HCS/index.html](http://www.heatcon.com/HCS/index.html)
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# AMTAS Participants

## *Industry Partners*

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- With offices in Kent WA, Hexcel is the largest U.S. producer of carbon fiber, the world's largest weaver of structural fabrics, and a leading global producer of fiberglass electronic materials and structural composite materials. Composite material products include carbon fibers, prepregs, adhesives, honeycombs, sandwich panels, resin transfer molding (RTM) systems, laminates, thermoplastics, and polyurethane systems.
  - [www.hexcel.com](http://www.hexcel.com)
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# AMTAS Participants

## *Industry Partners*

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- Located in Everett WA, Intec is an advanced materials center whose primary focus is the design, engineering, testing, machining, and fabricating of advanced material systems. Intec has extensive aerospace experience in prototyping and production of advanced materials manufacturing, machining, and testing.
  - [www.in-tec.com](http://www.in-tec.com)
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## AMTAS Participants *Industry Partners*

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- Located in Marysville WA, Northwest Composites is a full service provider of complete aircraft interiors as well as structural and non-structural composite components. NWC is responsible for the design, certification and fabrication of the Boeing 767 interior, and its customer base includes Boeing, Embraer, Bombardier, BAE Systems and all major airlines.
  - [www.nwcomposites.com](http://www.nwcomposites.com)
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## AMTAS Participants *Industry Partners*

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### ***Stoddard International***

- Located in Arlington WA, Stoddard International is a contract manufacturer specializing in aircraft composite manufacturing and tooling. The company primarily manufactures interior composite components for installation on Boeing commercial aircraft, through direct sales to Boeing, indirect sales to Boeing suppliers, and sales to the airline refurbishment/retrofit market.
  - <http://stoddardintl.com>
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# AMTAS Participants

## *Industry Partners*

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# **TORAY**

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## TORAY GROUP

- The Toray Group comprises 200 subsidiaries and affiliates located in 16 countries around the world, all of which are leading manufacturers of synthetic materials. Toray Composites (America) facilities are located near Tacoma WA and include a prepreg production facility that produces the BMS 8-276 carbon fiber epoxy prepreg used in the vertical fin and horizontal stabilizers of the 777 empennage and also in the 777 floor beams.
  - [www.torayusa.com/tca](http://www.torayusa.com/tca)
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# AMTAS Participants

## *Industry Partners*

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- The Triumph Group Inc. is a long-time Boeing supplier and consists of 41 companies in 19 states and 2 countries. One of these is Triumph Composite Systems, located in Spokane WA. The company was created in May 2002 when Boeing sold its Spokane plant to the Triumph Group.
  - [www.triumphgroup.com](http://www.triumphgroup.com)
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## AMTAS

### *Summary of Current Status*

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- Although the JAMS award was announced in December 2003, the Cooperative Agreement was finalized during summer 2004
  - Amendments to cooperative agreement authorizing transfer of FAA funds to academic partners completed Aug/Sept 2004
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# AMTAS

## *Summary of current status*

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- \$1.3M first-year budget (cash and in-kind)
  - A total of 7 AMTAS projects initiated (1 administrative, 5 research, and 1 education/training)
  - Executive Advisory Board partially established:
    - Larry Ilcewicz, FAA
    - Al Miller, Boeing
    - Walter Jones, AFOSR
  - Topics of future projects currently under consideration
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# AMTAS Administrative activities

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- (Aug '04) Recruited Ms. Ellen Barker
  - Developed web page:  
<http://depts.washington.edu/amtas>
  - Formal AMTAS meetings held:
    - 29 Jan '04: UW campus, ~35 attendees
    - 10 Nov '04: UW campus, ~ 40 attendees
    - 14 April '05 (scheduled): EdCC campus
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# AMTAS Administrative activities

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- Informal working meeting every 2-3 weeks:
    - Ilcewicz (FAA), Miller (Boeing), Casterline (Heatcon), Seaton (EdCC), Tuttle, Lin, Barker (UW)
    - Location rotated between UW, Boeing, FAA, EdCC
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# AMTAS Research Projects

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- Reliability-based Damage Tolerant Composite Design Methodologies (Lin, UW)
  - Aeroservoelastic effects in Composite Aircraft (Livne, UW)
  - Adhesive Bonding: Surface Characterization (Flinn, UW)
  - Adhesive Bonding: Effects of Surface Pretreatments (Smith, WaSU)
  - AF555 Hot/Wet Creep Response (Smith, WaSU)
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# AMTAS Education/ Training Project

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- Develop Short-Course: Maintenance/Repair of Composite Aircraft Structures (Seaton, EdCC)
  - Objectives:
    - Develop workshop (Dec 2004)
    - Develop curriculum( conduct prototype class August 2005)
    - Present outcome at workshop (Sept. 2005)
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